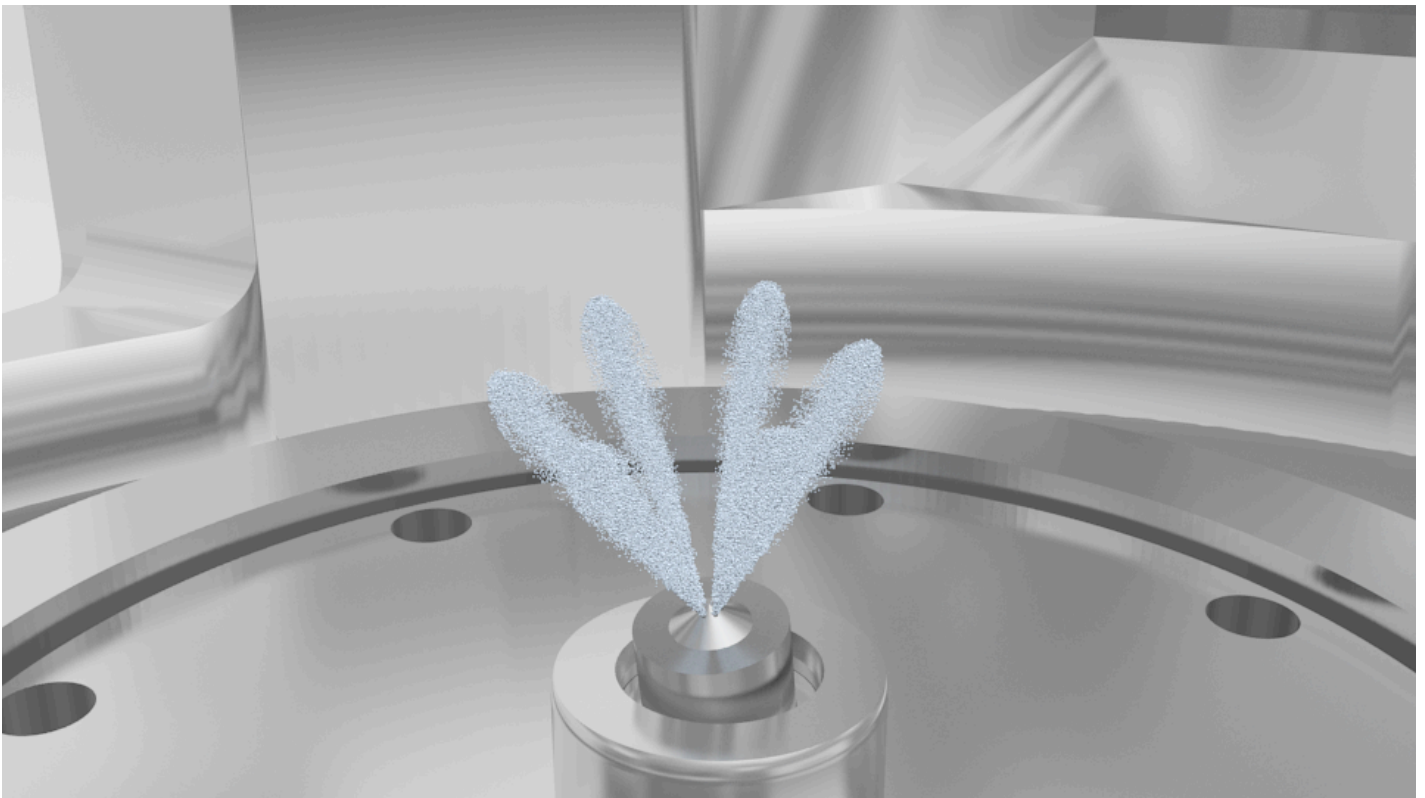




Prof. Dr.-Ing. Christian Hasse, TU Freiberg

## Biofuel sprays: the influence of thermodynamics and transport processes when looking on the liquid side of the interface



Fossil fuels are increasingly replaced by liquid biofuels in combustion processes. For IC engines, different fuels are available for diesel and gasoline engines. For the latter, ethanol is the major biofuel already introduced into the market and its importance especially in non-European countries is increasing even further. The use of alcohol has significant implications on the overall combustion system. In this talk, we focus on the evaporation and mixture formation process under IC engine-conditions. Blends of alcohols and alkanes are non-ideal mixtures from a thermodynamic point of view and effects such as azeotropic points are found for the Vapor-Liquid-Equilibria (VLE). Furthermore, due to the small diffusivities of the liquid fuel components, diffusion limitations for the volatile components are found. The effect of both the non-ideal thermodynamics and the transport limitations on the multi-component evaporation is studied both for single droplets and 3D CFD simulations of fuel sprays for high pressure injection systems.